National Weather Service
Storm Data and Unusual Weather Phenomena

May 2005

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
IOWA, Central									
Carroll County									
4 S Arcadia	**06**	**1916CST**			**0**	**0**	**1K**		**Hail(0.88)**
Calhoun County									
3 E Jolley	**06**	**2025CST**			**0**	**0**	**5K**		**Hail(1.25)**
Calhoun County									
1 S Jolley	**06**	**2026CST**			**0**	**0**	**2K**		**Hail(1.00)**
Humboldt County									
Humboldt	**06**	**2130CST**			**0**	**0**	**1K**		**Hail(0.88)**
Calhoun County									
3 SW Manson	**06**	**2137CST**			**0**	**0**	**1K**		**Hail(0.88)**
Calhoun County									
Manson	**06**	**2140CST**			**0**	**0**	**5K**		**Hail(1.00)**
Humboldt County									
Humboldt	**06**	**2140CST**			**0**	**0**			**Hail(0.75)**
Humboldt County									
Hardy	**06**	**2145CST**			**0**	**0**			**Hail(0.75)**
Humboldt County									
Humboldt	**06**	**2150CST**			**0**	**0**	**3K**		**Hail(0.88)**
Calhoun County									
Manson	**06**	**2200CST**			**0**	**0**	**10K**		**Hail(1.25)**
Webster County									
Lehigh	**06**	**2240CST**			**0**	**0**	**5K**		**Hail(1.00)**
Webster County									
Lehigh	**06**	**2255CST**			**0**	**0**	**25K**		**Hail(1.75)**
Emmet County									
Estherville	**06**	**2330CST**			**0**	**0**	**2K**		**Hail(0.88)**
Webster County									
1 S Gowrie	**07**	**0306CST**			**0**	**0**			**Hail(0.88)**
Emmet County									
Estherville	**07**	**0330CST** **0500CST**			**0**	**0**	**25K**		**Flash Flood**

A spring type weather pattern returned to Iowa during the day on the 6th. A nearly stationary front extended from South Dakota, southeast to near Fort Dodge, then east to near Waterloo. South of the front the air was warm and quite unstable with temperatures in the upper 70s during the afternoon and dew points in the upper 50s to low 60s. North of the front, temperatures were in the mid 70s however dew point temperatures were in the 30s to mid 40s. By early evening the sounding from Omaha indicated a lifted index of -6 with a CAPE of 1500 to 2000 J/kg. The freezing level was relatively low, around 12,000 feet. As the sun set the low level jet strengthened. By the late evening hours the jet was in the 40 to 50 kt range across the front. Thunderstorms erupted along the frontal boundary during the evening and became severe quite quickly. The mode of severe weather was in the form of hail. Some cell splitting took place with several left movers noted. Most of the hail was in the three quarter inch to one inch in diameter range. A few reports of one and one quarter inch hail were received. The largest hail was in Webster County with golf ball size hail falling on the town of Lehigh. Of note was the amount of hail reported with one of the storms as it moved through Calhoun County. Hail accumulated to a depth of two inches south of Jolley. The storms became heavy rain producers as the night wore on. Emmet County was hard hit with 3 to 5 inches of rain falling in the Estherville area. The heaviest official rain total was at the river gage in Estherville with 5.39 inches. The observer from Estherville reported 4.77 inches at the Emergency Managers office. Roads were flooded in and around Estherville and a campground required evacuation at the fairgrounds there

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IOWA, Central

IAZ004>005-015 **Emmet - Kossuth - Palo Alto**

	07 09	0645CST 1200CST			0	0	30K		Flood

The first several days of May were dry, however very heavy rains affected a small area of northwest and north central Iowa on the night of the 6th. At Estherville 4.71 inches of rain was reported unofficially between 6 and 9 pm, with a storm total of 5.39 inches. The heavy rainfall caused some minor flooding across the area, however damage was limited to agricultural lands for the most part.

Sac County									
2 NNE Wall Lake Muni .	**08**	**1445CST**			**0**	**0**	**1K**		**Hail(0.88)**
Crawford County									
Charter Oak	**08**	**1506CST**			**0**	**0**	**5K**		**Hail(1.00)**
Pocahontas County									
2 SE Palmer	**08**	**1520CST**			**0**	**0**	**1K**		**Hail(0.88)**
IAZ035>036-047>048-061	**Webster - Hamilton - Boone - Story - Jasper**								
	08	**1530CST** **1700CST**			**0**	**0**	**105K**		**High Wind (EG57)**
Palo Alto County									
Mallard	**08**	**1533CST**			**0**	**0**	**5K**		**Hail(1.00)**
Crawford County									
Vail	**08**	**1539CST**			**0**	**0**			**Hail(0.75)**
Carroll County									
4 W Breda	**08**	**1542CST**			**0**	**0**	**2K**		**Thunderstorm Wind (EG61)**
Palo Alto County									
Mallard	**08**	**1551CST**			**0**	**0**	**5K**		**Thunderstorm Wind (MG63)**
Palo Alto County									
4 S Emmetsburg	**08**	**1553CST**			**0**	**0**	**2K**		**Hail(1.00)**
Emmet County									
Ringsted	**08**	**1615CST**			**0**	**0**			**Hail(0.75)**
Emmet County									
Ringsted	**08**	**1619CST**			**0**	**0**	**25K**		**Hail(2.00)**
Emmet County									
Ringsted	**08**	**1624CST**			**0**	**0**	**1K**		**Hail(0.88)**
Kossuth County									
12 SE Whittemore	**08**	**1633CST**			**0**	**0**			**Hail(0.75)**
Pocahontas County									
Countywide	**08**	**1634CST** **2030CST**			**0**	**0**	**25K**		**Flash Flood**
Kossuth County									
Lakota	**08**	**1640CST**			**0**	**0**	**3K**		**Hail(1.00)**
Kossuth County									
Lakota	**08**	**1643CST**			**0**	**0**	**1K**		**Hail(0.88)**
Humboldt County									
Bradgate	**08**	**1646CST**			**0**	**0**	**1K**		**Hail(0.88)**
Kossuth County									
Algona	**08**	**1700CST** **2046CST**			**0**	**0**	**25K**		**Flash Flood**
Hancock County									
Kanawha	**08**	**1730CST**			**0**	**0**	**1K**		**Thunderstorm Wind (EG50)**

A complicated weather situation was found during the afternoon of the 8th. A large upper level low pressure system was positioned

IOWA, Central

over the western U.S. with a broad south to southwest flow of air over the middle of the nation. Surface low pressure moved across South Dakota during the afternoon. A dry line extended south from the low and tracked across Nebraska. At the same time, a vorticity maximum lifted northeast from Oklahoma into Iowa during the late afternoon hours. Convergence and lift were both enhanced by these features. The airmass became quite unstable during the afternoon, especially over the west half of Iowa. Surface temperatures warmed into the low to mid 80s as dew point readings reached the low 60s. By mid afternoon, the lifted index fell to around -9 C with no cap in place and 2000 to 3000 J/kg of CAPE. The freezing level was relatively low, being just below 12,000 feet at the beginning of the event. Cold air advection took place aloft, lowering the freezing level to 11,000 by late afternoon. Three areas of thunderstorms developed. The dry line kicked off a line of severe thunderstorms to the west of Iowa. These storms did not directly affect Iowa, however they did enhance convergence in the flow. A second area formed over western Iowa as the airmass became very unstable. Thunderstorms erupted by mid afternoon. Many of them produced hail of three quarters of an inch to an inch in diameter. Hail covered the ground in a few locations. In Emmet County, the town of Ringsted received hail of 2 inches in diameter. There were some reports of gusty winds with the storms, however winds of severe strength were limited. Seventy MPH winds were reported west of Breda in Carroll County. In Palo Alto County, a 73 MPH wind gust was measured in the town of Mallard. These storms formed in a northeast to southwest line and trained over areas of northwest Iowa. This resulted in flash flooding in Pocahontas and parts of Kossuth Counties. Two to two and one half inches of rain fell in about an hour in these areas. These were the same areas that received heavy rainfall just 48 hours prior. Water overtopped roads countywide in Pocahontas County. Flooding was less severe in Kossuth County, however the flooding took place in and around the town of Algona. The short wave lifting north from Oklahoma produced convection. Though the convection was not severe, it did aid in the production of a high wind event. The storms moved into Iowa and collapsed, producing an outflow that expanded north across the central counties. Winds of 35 to 40 MPH, with gusts to over 60 MPH pushed north across several counties in the central sections of the state. The winds caused considerable blowing dust in these areas and there were numerous reports of trees being blown down. In Story County, two to three foot diameter trees were toppled. One of them fell onto a house in Huxley, causing considerable damage to the house.

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Killed	Injured	Property	Crops	Character of Storm
Audubon County									
3 W Gray	**10**	**1826CST**			**0**	**0**	**2K**		**Hail(1.00)**
Audubon County									
2 SW Brayton	**10**	**1830CST**			**0**	**0**			**Hail(0.88)**
Audubon County									
2 SW Brayton	**10**	**1832CST**			**0**	**0**	**2K**		**Hail(1.00)**
Audubon County									
2 SW Audubon	**10**	**1833CST**			**0**	**0**	**2K**		**Hail(1.00)**
Audubon County									
3 SW Audubon	**10**	**1839CST**			**0**	**0**	**10K**		**Hail(2.00)**
Audubon County									
2 W Gray	**10**	**1854CST**			**0**	**0**			**Hail(0.75)**
Carroll County									
3 S Manning	**10**	**1856CST**			**0**	**0**	**2K**		**Hail(0.88)**
Audubon County									
1 NE Kimballton to 2 ENE Kimballton	**10**	**1858CST 1905CST**	**2**	**40**	**0**	**0**	**2K**		**Tornado (F0)**
Tornado tracked through open fields.									
Audubon County									
8 NE Audubon	**10**	**1912CST**			**0**	**0**	**2K**		**Hail(1.00)**
Audubon County									
1 N Kimballton to 2.5 NE Kimballton	**10**	**1913CST 1917CST**	**2**	**40**	**0**	**0**	**2K**		**Tornado (F0)**
Tornado tracked through open fields.									
Audubon County									
2 SSE Audubon to 3 ESE Audubon	**10**	**1920CST 1926CST**	**2.5**	**40**	**0**	**0**	**2K**		**Tornado (F0)**
Tornado tracked through open fields.									
Audubon County									
Audubon	**10**	**1938CST**			**0**	**0**	**5K**		**Hail(1.00)**

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
IOWA, Central									
Crawford County									
6 ENE Manilla	**10**	**2005CST**			**0**	**0**			**Hail(0.75)**
Guthrie County									
3 W Guthrie Center	**10**	**2005CST**			**0**	**0**	**10K**		**Hail(1.75)**
Carroll County									
Manning	**10**	**2010CST**			**0**	**0**	**25K**		**Hail(1.75)**
Guthrie County									
8 W Guthrie Center	**10**	**2010CST**			**0**	**0**			**Hail(0.75)**
Guthrie County									
3 WSW Guthrie Center	**10**	**2010CST**			**0**	**0**	**3K**		**Hail(1.00)**
Audubon County									
9 SW Audubon	**10**	**2023CST**			**0**	**0**			**Hail(0.75)**
Guthrie County									
3 WSW Guthrie Center	**10**	**2024CST**			**0**	**0**	**1K**		**Hail(0.88)**
Audubon County									
3 E Exira	**10**	**2032CST**			**0**	**0**	**2K**		**Hail(1.00)**
Guthrie County									
6 SSE Guthrie Center	**10**	**2047CST**			**0**	**0**	**5K**		**Hail(1.75)**
Guthrie County									
3 SE Panora	**10**	**2050CST**			**0**	**0**			**Hail(0.75)**
Guthrie County									
3 NE Stuart	**10**	**2107CST** **2122CST**			**0**	**0**	**10K**		**Hail(1.75)**
Cass County									
1 N Atlantic Arpt	**10**	**2109CST**			**0**	**0**			**Hail(0.75)**
Dallas County									
Dexter	**10**	**2113CST**			**0**	**0**			**Hail(0.75)**
Dallas County									
2 E Dexter	**10**	**2124CST**			**0**	**0**			**Hail(0.75)**
Winnebago County									
2 NW Forest City	**10**	**2132CST**			**0**	**0**			**Hail(0.75)**
Winnebago County									
Forest City	**10**	**2138CST**			**0**	**0**	**5K**		**Hail(1.00)**
Winnebago County									
Forest City	**10**	**2140CST**			**0**	**0**	**2K**		**Hail(0.88)**
Winnebago County									
3 NNE Forest City Arpt	**10**	**2143CST**			**0**	**0**	**2K**		**Hail(0.88)**
Dallas County									
6 E Dexter	**10**	**2146CST**			**0**	**0**			**Hail(0.75)**
Dallas County									
De Soto	**10**	**2152CST**			**0**	**0**	**5K**		**Hail(1.00)**
Dallas County									
5 W De Soto	**10**	**2153CST**			**0**	**0**	**2K**		**Hail(0.88)**
Worth County									
3 W Fertile	**10**	**2155CST**			**0**	**0**	**3K**		**Hail(1.00)**
Audubon County									
Kimballton	**10**	**2200CST**			**0**	**0**	**10K**		**Hail(1.50)**

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
IOWA, Central									
Dallas County									
8 E Dexter	**10**	**2202CST**			**0**	**0**			**Hail(0.75)**
Dallas County									
3 W De Soto	**10**	**2203CST**			**0**	**0**	**10K**		**Hail(1.75)**
Madison County									
5 S Earlham	**10**	**2208CST**			**0**	**0**	**2K**		**Hail(0.88)**
Audubon County									
Brayton	**10**	**2210CST**			**0**	**0**	**2K**		**Hail(0.88)**
Madison County									
7 N Winterset	**10**	**2225CST**			**0**	**0**	**2K**		**Hail(0.88)**
Cerro Gordo County									
1 N Mason City	**10**	**2228CST**			**0**	**0**	**3K**		**Hail(1.00)**
Dallas County									
Redfield	**10**	**2230CST**			**0**	**0**	**5K**		**Hail(1.00)**
Winnebago County									
5 SSW Thompson	**10**	**2230CST**			**0**	**0**			**Hail(0.75)**
Dallas County									
2 S De Soto	**10**	**2231CST**			**0**	**0**	**3K**		**Hail(1.00)**
Polk County									
4 NW Des Moines	**10**	**2258CST**			**0**	**0**	**2K**		**Hail(0.88)**
Polk County									
2 N Des Moines	**10**	**2301CST**			**0**	**0**			**Hail(0.75)**
Audubon County									
Audubon	**10**	**2302CST**			**0**	**0**	**2K**		**Hail(0.88)**
Polk County									
2 N Des Moines	**10**	**2304CST**			**0**	**0**	**5K**		**Hail(1.00)**
Warren County									
Bevington	**10**	**2305CST**			**0**	**0**			**Hail(0.75)**
Cass County									
4 ESE Atlantic Arpt	**10**	**2311CST**			**0**	**0**	**3K**		**Hail(1.00)**
Audubon County									
Audubon	**10**	**2315CST**			**0**	**0**	**3K**		**Hail(1.00)**
Warren County									
1 SW St Marys	**10**	**2323CST**			**0**	**0**			**Hail(0.75)**
Jasper County									
Newton	**10**	**2355CST**			**0**	**0**	**3K**		**Hail(0.88)**
Marion County									
Harvey	**11**	**0000CST**			**0**	**0**	**2K**		**Thunderstorm Wind (EG52)**
Poweshiek County									
Grinnell	**11**	**0030CST**			**0**	**0**	**10K**		**Thunderstorm Wind (EG54)**
Hamilton County									
Webster City	**11**	**0200CST**			**0**	**0**	**50K**		**Lightning**

A volatile situation took shape during the afternoon of the 10th. A unseasonably deep upper low had formed aloft over the southwest U.S., while at the same time a cold front dropped south across the state during the day. Behind the cold front was a strong polar high pressure area. The southwest flow aloft impinged on the frontal boundary, setting the stage for very strong thunderstorm development. Temperatures reached the low 90s over far southwest Iowa, with mid 80s over the central sections. Dew points reached the mid 60s to the south of the front by late afternoon. North of the front, temperatures were in the 50s during the afternoon. The very unstable air was lifted north over the frontal boundary with explosive development during the early evening as the low level jet began to strengthen. The airmass to the south was very unstable with lifted indices of -11 C., CAPE values of 3500 J/kg, and a

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IOWA, Central

freezing level of only 13,300 feet. Hail was very widespread with the event. During the initial convection, a super-cell moved into southwest Iowa. This storm dropped three small tornadoes in Audubon County. All of the tornadoes were relatively short lived and caused little damage as they were in open areas. The main weather feature was the hail. There were numerous reports of nickel to quarter size hail with the storms. Th largest hail occurred with the super cell in Audubon County, with tennis ball size hail falling southwest of Audubon. In several reports of hail of ping pong to golf ball size were received from Carroll and Guthrie Counties. As the evening progressed, a secondary line of storms formed to the north of the developing MCS. These formed in an east to west line across northern Iowa, producing a round of hail there. Late in the storm life cycle, a few of the storms began to produce strong winds. As one of the storms moved through the Des Moines area, winds of 57 MPH were measured. Some minor damage occurred to a fast food sign. Sixty MPH winds were reported in Marion County, while 60 to 65 MPH winds blew down power line poles in Poweshiek County. Late in the event, as the storms moved through Hamilton County, lightening struck a storage and repair shop building in Webster City. The building was set ablaze and was a total loss.

IAZ025>028-036>039-048>049 **Wright - Franklin - Butler - Bremer - Hamilton - Hardin - Grundy - Black Hawk - Story - Marshall**

12	**0930CST**	**0**	**0**	**100K**		**High Wind (MG62)**	
	1130CST						

An area of thunderstorms moved across the state. The storms were elevated in nature and well north of the frontal boundary. A strong high pressure area was poised to the north in Canada, creating a moderate easterly flow across the state. As the precipitation ended a wake low formed behind the convection. High winds resulted over several counties. The strongest winds was recorded from an RWIS site southwest of Marshalltown in Marshall County. Winds gusted to 72 MPH. There were scattered reports of damage, mostly by toppled trees. A few reports of damage to out buildings and carports were also received.

IAZ004>006-015>016-023>025-033>036-044>047-057>061-071>075-083>086-096>097 **Emmet - Kossuth - Winnebago - Palo Alto - Hancock - Pocahontas - Humboldt - Wright - Sac - Calhoun - Webster - Hamilton - Crawford - Carroll - Greene - Boone - Audubon - Guthrie - Dallas - Polk - Jasper - Adair - Madison - Warren - Marion - Mahaska - Clarke - Lucas - Monroe - Wapello - Appanoose - Davis**

13	**0200CST**	**0**	**0**	**960K**		**Flood**	
17	**1200CST**						

Another round of heavy rainfall occurred during the middle part of the month. The month's most widespread rainfall occurred from late on the 10th until early on the 13th when an average of 2.42 inches of rain fell across the state. Nearly all of Iowa recorded at least an inch of rain during this 60 hour period with Adair reporting the most with 6.70 inches. Rain fell frequently during the last half of the month but amounts were on the light side with a state average of only 0.84 inches after the 14th. As was the case in April, precipitation was generally well below normal in eastern Iowa and near to above normal elsewhere. Preliminary monthly totals vary from 1.45 inches at Washington, their driest May since 1992, to 8.50 inches at Estherville, their highest May total since 1965. Streamflow was elevated throughout the month of May across nearly all of Iowa. Heavy rain occurring in the middle of May brought numerous rivers across the Des Moines HAS to bankfull levels and some places would experience flooding. Flooding was by far the worst across northern Iowa, where inflow into the upper Des Moines basin would bring significant flooding to the areas near Estherville and Algona and points immediately downstream. Elevated river conditions would then persist through the end of the month. The flooding did cause some damage around the state, however most of the flooding was in agricultural lands. The actual amount of property damage was relatively limited.

Polk County

Des Moines Arpt	**18**	**0930CST**	**0**	**0**		**Hail(0.75)**	

A frontal boundary advancing east across Nebraska pushed east as a line of thunderstorms developed ahead of the front. A strong low level jet was in place over western Iowa, along with a narrow ribbon of 55 to 60 degree dew points. Thunderstorms advanced across Iowa during the morning and produced brief heavy rain and some pea size hail. One of the cells dropped penny size hail at the Des Monies Airport and was reported by the 132nd Tactical Wing of the Air National Guard

Calhoun County

2 N Farnhamville to	**18**	**1758CST**	**2**	**100**	**0**	**0**	**50K**		**Tornado (F1)**

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm

IOWA, Central

2 NNE Farnhamville **1803CST**

Tornado touched down on a farm north of Farnhamville, damaging several buildings on the farm. The tornado moved from Calhoun County into Webster County.

Webster County

1 WSW Slifer to 5.7 NE Lehigh **18** **1803CST 1837CST** **22.5** **50** **0** **0** **40K** **Tornado (F1)**

Tornado moved from Calhoun County into Webster County. It moved through mostly open country and have a very intermittent track from Slifer on northeast. Damage occurred to several grain bins, then tornado lifted for some time with another tornado forming over Hamilton County.

Hamilton County

4 N Blairsburg **18** **1938CST** **0.2** **20** **0** **0** **10K** **Tornado (F0)**

Tornado occurred north of Blairsburg with only a bried touchdown

The frontal boundary from Nebraska moved into western Iowa during the evening hours. The airmass was unstable, but not overly so. CAPE values were around 1500 J/kg with Lifted Indices around -2. There was about 45 kts of effective shear in place. A few thunderstorms developed ahead of the boundary with one of the cells becoming severe. The first tornado occurred in Calhoun County at 2358 UTC where the tornado dropped into a farm field between York ave and Zearing Ave south of 320th St. about 2 miles north of Farnhamville. The tornado was an F1 tornado as it crossed the intersection of Zearing and 320th St. IT destroyed dome outbuildings north of the intersection and continued moving northeast toward Slifer in Webster County. The tornado remained on the ground crossing the Calhoun/Webster County line crossing County Road D46 between Zebulon Ave and County Road P29. The tornado destroyed three grain bins and just missed a farm. Debris was tossed over several hundred yards before the tornado weakened and lifted for the first time prior to reaching Slifer. The F1 tornado was on the ground for about 4 miles during this time with F1 strength and a width of 50 to 100 yards. The tornado was reported on the ground very intermittently from this point on with numerous reports southwest of Callender, northeast through the Woodman Hol State preserve and into the Brushy Creek State Reserve. At this point, the tornado lifted. The parent storm continued into Hamilton County. A brief touchdown was reported in Hamilton County north of Blairsburg. No damage was reported and the tornado roped out quickly.

Cerro Gordo County

Mason City **21** **1130CST** **0** **0** **5K** **Lightning**

Thunderstorms moved through the Mason City area. As the storms moved through, lightning struck a tree. The lightning bolt ruptured a gas line in the area, resulting in a fire and minor damage.

Butler County

2 S Greene **26** **1528CST** **0.2** **25** **0** **0** **Tornado (F0)**

Brief touchdown in open field south of town.

Dallas County

Woodward **26** **1555CST** **0** **0** **2K** **Thunderstorm Wind (EG50)**

Boone County

Boone Muni Arpt **26** **1713CST** **0** **0** **3K** **Thunderstorm Wind (MG50)**

Boone County

Boone **26** **1930CST** **0** **0** **5K** **Thunderstorm Wind (EG52)**

Thunderstorms developed during the mid to late afternoon hours and persisted into the evening. A weak trough of low pressure moved through the state during the afternoon setting off the first line of thunderstorms. A cold front dropping south through South

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm

IOWA, Central

Dakota formed another line of thunderstorms to the northwest. These storms raced southeast into the state at nearly 50 kts. The airmass was fairly unstable as a closed upper level low was settling into the area and the cold pool was in place aloft. Freezing levels were in the 8000 to 8500 foot range. The Lifted Index was around -5 by late afternoon with 800-1000 J/kg of CAPE. The airmass was quite dry in the low levels with soundings showing an inverted "V" type structure in a unidirectional profile. Considerable virga was reported with most of the storms producing 45 to 55 MPH winds as they passed. A few produced small hail, and one produced a tornado that touched down briefly in a rural area of Butler County. Damage was spotty with small limbs being taken down. High winds tore a stop sign out at the base in Dallas County at Woodward. Trees were downed in the city of Boone in Boone County. The storms weakened quite rapidly once sunset occurred.